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ORIGINAL ARTICLE

Etiology of Hepatocellular Carcinoma and Association with Hepatitis B & C Virus

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ABSTRACT

Aim: To evaluate the association of hepatitis with the hepatocellular carcinoma. Hepatitis is known as the inflammation of the liver.
Methods: Hepatitis C and B may lead to HCC (hepatocellular carcinoma), such as Hepatitis B may cause 50% and hepatitis C is responsible for 70 to 80 % of cases of HCC. Obesity, alcohol and type 2 diabetes are also a predisposing factor for HCC. HCC is the malignant tumor, and have a low survival rate due to reoccurrence.
Results: Eighty two patients were selected with hepatitis and HCC. This cross-sectional study was conducted at Allied Hospital Faisalabad. Ultrasound machine of Toshiba was used with a transducer of frequency 3-6MHz for the liver scanning. 82 patients with hepatitis B, C, and HCC were included in this study. Out of 82 patients, 55 were male and 27 were female. The mean age was 55yrs. Group A 45 (54%) patients were infected with hepatitis C and Group B 35(42%) patients were infected with hepatitis B. Hepatitis C is the most common cause of HCC as compared to hepatitis B.
Conclusion: In this study, it is concluded that there is a positive association between hepatitis and Hepatocellular Carcinoma. The patient infected with hepatitis C is more prone to develop HCC than those infected with hepatitis B.
Keywords: HCC (hepatocellular carcinoma), Hepatitis B, C, lesion.

INTRODUCTION

Hepatitis is an inflammation of the liver. It can be symptomatic and asymptomatic. It can occur due to a virus known as viral hepatitis. Viral hepatitis is a severe problem for worldwide. There are different types of hepatitis (Ogholikhan and Schwarz, 2016). Autoimmune hepatitis develops more commonly in young women, girls, and it led to cirrhosis and fibrosis. It may progress to hepatocellular cancer (Mittal and El-Serag, 2013a).

Hepatitis B is the leading risk factor of HCC, and responsible for at least 50% of HCC cases. Hepatitis B affects people worldwide. According to the WHO 2 billion people of the world's total population infected with hepatitis B virus (Lavanchy, 2004). It is a common reason for Liver cancer. Non-viral HCC caused due to the alcoholic and non-alcoholic fatty liver. Incidence of HCC in men is 4 to 6 times more in men than in women due to alcohol (Lau and Lai, 2008).

Hepatitis B virus causes many serious liver diseases to include acute and chronic disease. For example, Chronic Hepatitis cause Cirrhosis can lead to HCC. It is noted that 15 to 40% of patients can develop cirrhosis, liver failure and HCC (Perz et al., 2006a). HBV can cause HCC in the non-cirrhotic liver, though most HBV related HCC could occur in cirrhotic liver (Clark, 2006). Not all individuals recover about 5-10% of patients are capable to clear the virus. Individuals who are chronically infected may have mild liver disease (Mittal and El-Serag, 2013b). 5% of cases of hepatitis B virus may lead to chronic diseases (Sheldon et al., 2008).

There are >300 million carriers of HBV are present worldwide. Above 80% are of primary liver cancer (Perz et al., 2006b). If the patient is infected with hepatitis B virus and receiving the best treatment therapy may at the risk of developing HCC. Treatment therapy reduces the progression of HCC (Chen et al., 2008). Hepatitis C is an enveloped single-stranded RNA virus. It is a common worldwide disease. Incidence of HCC increase in western countries due to the increase in the hepatitis C virus (Pazgan-Simon et al., 2018).

Hepatitis C is the main cause of HCC in the USA, Canada &Japan due to the consumption of alcohol. It may develop cirrhosis with subsequent complications such as ascites, variceal bleeding and hepatocellular. Hepatitis C is transmitted through percutaneous exposure. It may also be spread by vertical transmission from mother to neonatal. Chronic infection develops in 70 to 80 % individuals along with Hepatitis C and may lead to hepatocellular carcinoma (Llovet et al., 2008). Hepatitis c virus can cause architectural changes in the hepatic lobe, necroinflammation components, and hepatic steatosis. Influence of hepatitis C in cirrhosis is 16% to 62% (Moudgil et al., 2017).

Hepatitis B & C known as the major etiological factor for HCC. Obesity and Diabetes type 2 is also considered as a predisposing factor for HCC.HCC is frequent in specific genetic diseases like Wilson disease(copper overloaded disease), hemochromatosis(iron overloaded disease)and porphyria, Other factors may also contribute in Hepatocellular carcinoma-like dietary aflatoxin exposure in parts of Africa and Asia (Tang et al., 2018). Hepatocellular carcinoma (HCC) is a malignant tumor and have a very poor prognosis. Improvement in diagnostic medical imaging technology made its diagnosis easy. Patients with HCC have a low survival rate due to reoccurrence (Bruix et al., 2016).

The occurrence of HCC has become double from last 15 years &mortality increase by 45% because of a huge number of infected individuals. In HCC Neovascularity, increase and arterial blood movement become dominant. It is suggested that the risk of HCC can develop in the non-cirrhotic liver due to some reasons (Kao et al., 2003). Medical imaging is a non-invasive technique that is used to diagnose different diseases. It gives the anatomical and physiological information of the body and about physical and disease-related changes. Normal liver presents homogenous echotexture and intermediate echogenicity. Attenuation of the ray is refined allowing the good identification of hepatic vessel. In inflammatory liver disease, findings vary according to the stage of the disease. For the diagnosis of HCC USG is suitable and safest modality. It can detect the fibrosis and cirrhosis that is within and around the liver. It is not damaging for the patients because it has no radiation, but in a heavy patient, it does not offer an adequate indication about HCC. These days contrast-enhanced ultrasound is used. In the case of cirrhosis, CEUS more relevant (Athuluri-Divakar and Hoshida, 2019).

As we know, the number of cases of hepatocellular carcinoma (HCC) is increasing day by day. In this study, I figure out the main and underlying cause of HCC. I figure out the number of individuals, who were suffering from the HCC, also check its association with hepatitis, age, and gender.

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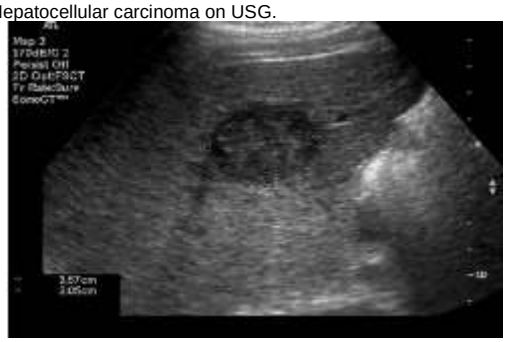
The objective of the study was to evaluate the association of hepatitis with the hepatocellular carcinoma. Hepatitis is known as the inflammation of the liver.

MATERIAL AND METHOD

All the scans were conducted at Allied Hospital, Faisalabad, Pakistan. A total number of 82 respondents were included in this study. Permission was sought from Ethical Review Board and consent from all the respondents was taken. Patient's height, weight, and age were noted. Then we measure the height of the patient with the stadiometers and weight with the help of a weight machine. Then the history of the patients was taken. After taking history explained the whole procedure and then the ultrasound of the abdomen were performed with the help of real-time ultrasound machine and the transducer with the frequency of 2-3MHz. The patient lies supine on the table. Then applied jell over area of interest. I asked the patients to take some deep breaths to scan the superior borders of liver. Measure the size of the liver sagittal approach in the midclavicular line is used. I placed the probe on intercostal spaces to scan the right and middle hepatic vein. To scan the left lobe of liver I placed the probe on the epigastric region just below the sternum. Measure the size of the liver and check the borders. When the probe is placed, a vertically lateral segment of the hepatic left lobe is visualized. For the right lobe of liver parasagittal, scan plan is used. Lesions and masses also identified. Collected was analyzed by using Univariate and Bivariate technique were also applied to analyze the data. Patients who are diagnosed with hepatitis and HCC of all ages were included in this study.

Fig.1: Hepatocellular carcinoma on USG.



RESULTS

In this study, the number of respondents was 82. Out of 82 respondents, 49(60%) were males and 33(40%) were females. Most of the respondents were married and Punjabi speaking. Range of the age of these individuals was 15 to 45 years.

Table 1 shows the number of patients in hepatitis B and hepatitis C. In hepatitis B the no of patients was 35 and in hepatitis C were 47.

Table 2 shows the age range of hepatitis B patients.

Table 3 shows the age distribution of hepatitis C patients according to gender.

In table 4 **A**ccording to my results, the number of patients suffering from fever, weight loss and loss of appetite in hepatitis B was 19, 35 and 26 respectively. The number of patients suffering from fever, weight loss and loss of appetite in hepatitis C was 18, 47 and 18 respectively.

Table 5 shows the Sonographic results shows that all the patients who are suffering from HCC have the lesion and cirrhosis.

Table 1: Total number of patients of hepatitis B & C

Total no. of patients	Hepatitis B patients	Hepatitis C Patients
82	35	47

Table 2: Age range of hepatitis B patients

Age range of hepatitis B patients	Male	Female
40-50	11	6
51-60	6	1
61-70	11	1

Fig. 2: Percentage of male and female

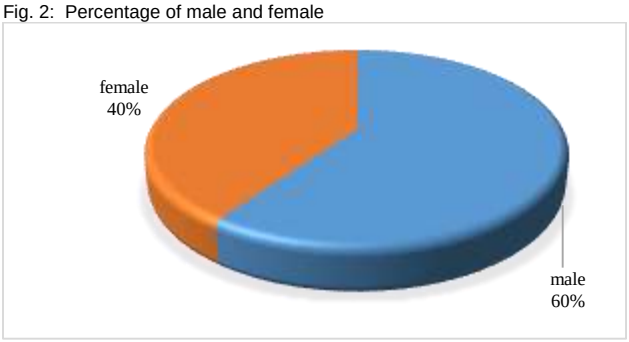


Table 3: Age distribution of hepatitis C patients according to gender

Age range of hepatitis c patients	Male	Female
40-50	10	10
51-60	10	6
61-70	9	1

Table 4: Distribution of hepatitis B & C patients according to signs and symptoms

Signs & Symptoms	No. of hepatitis B patients	No. of hepatitis c patients
Fever	19	18
Weight loss	35	47
Loss of appetite	26	18

Table 5: Sonographic results

Sonographic Findings	No. of Hepatitis B Patients	No of Hepatitis C Patients
Lesions	35	47
Cirrhosis	35	47

DISCUSSION

We observed that patients who were suffering from the Hepatocellular carcinoma might have an underlying disease. Prevalence of HCC is increasing day by day. Most of the people are unaware of this disease, and they did not pay attention to sign & symptoms. They don't visit the doctor properly may due to the lack of time or due to the lack of money, because the treatment of HCC is very expensive most of the people cannot afford. Different types of tests may be performed to diagnose liver disease. Radiological modality, which we use to diagnose the liver cancer, was ultrasound. It is not very expensive and affordable and does not harm patients. It is the safest modality and easy to use. With the help of ultrasound, we can check any type of cirrhosis, mass, lesion, and check the echogenicity and borders of the liver.

Christoph F. and his colleagues did the study on the ultrasound of the liver. In their study, they mentioned the benefits of ultrasound. Ultrasound is the first radiological modality that is using to image the liver. Ultrasound is using to evaluate to cirrhosis and its stage, ascites and any lesion in the liver. It is also beneficial for the follow-up study. We observed that in HCC, there is cirrhosis and lesion in the liver, and symptoms that appear in the HCC are weight loss, loss of appetite & fever. Fever is very rare. We observed that there is the association of Hepatitis B & Hepatitis C with the HCC. These are the main causative agents for HCC. Patients with hepatitis C are more prone to develop HCC. The occurrence of hepatitis is most common in males than in females. It may develop in advance age.

Benvegn et al did the study on risk factor for HCC. HCV, HBV, and cirrhosis are a risk factor for HCC. In this research, they conclude that cirrhosis, male patient and advanced age are also a major risk factor for the HCC (Benvegnù and Alberti, 1996). We observed 82 patients 49 were male and 33 were female at Allied Hospital Faisalabad. We also observe that cirrhosis male gender hepatitis and advanced age are major risk factors for the HCC. Beasley did the research on the association of hepatitis B with HCC. He found that hepatitis B is the major risk factor for HCC (Beasley, 1988). However, we found in my research that patients with, hepatitis C are more prone to develop HCC than patients with hepatitis C. Takano et al. did research on the incidence of HCC on Japanese people. HCV and HBV contributed to HCC, whereas HCV has a strong contribution about 3 folds than HBV (Takano et al., 1995). In our research, that we did in Faisalabad, Pakistan, we concluded that HCV has a very strong contribution in HCC.

CONCLUSION

HCC is the most common type of cancer and the leading cause of cancer all around the world. Currently, there are two major factors that mainly because HCC are HBV and HCV. Individuals who infected with HCV are more prone to develop HCC than who is infected with HBV. Hepatitis B is responsible for 50% of HCC cases whereas Hepatitis C is responsible for 70 to 80% of HCC cases. Chronic hepatitis may lead to cirrhosis, and cirrhosis may cause liver damage. Patients with cirrhosis are at high risk to develop HCC. HCC can develop without cirrhosis. It is noted that individuals who are infected with hepatitis B may develop cirrhosis about 15 to 20 %, and individuals who are infected with hepatitis C may develop about 16 to 62%. About 10% of the non-cirrhotic liver can develop HCC. Patients with HCC may have a poor appetite, weight loss, fever (less common) and visible mass in upper abdominal part. Other underlying causes are male sex, advanced age, obesity, diabetes type 2 alcohol consumption and smoking. Prevalence of HCC is less common in females

Conflict of interest: Nil

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